

CURRENT SECTION/FOCUS GROUP: Earth and Space Science Informatics (IN)
CURRENT SESSION: IN07. Current Capabilities and Future Needs of Near Real-Time Data: Perspectives from Users and Producers

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INDEX TERMS: 1918 - Decision analysis, 1920- Emerging informatics technologies, 1964- Real time and responsive information delivery, 9820 – Techniques applicable in three or more fields

TITLE: The Waypoint Planning Tool: Real Time Flight Planning for Airborne Science
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ABSTRACT:

NASA Earth science research utilizes both spaceborne and airborne real time observations in the planning and operations of its field campaigns. The coordination of air and space components is critical to achieve the goals and objectives and ensure the success of an experiment. Spaceborne imagery provides regular and continual coverage of the Earth and it is a significant component in all NASA field experiments. Real time visible and infrared geostationary images from GOES satellites and multi-spectral data from the many elements of the NASA suite of instruments aboard the TRMM, Terra, Aqua, Aura, and other NASA satellites have become norm. Similarly, the NASA Airborne Science Program draws upon a rich pool of instrumented aircraft. The NASA McDonnell Douglas DC-8, Lockheed P3 Orion, DeHavilland Twin Otter, King Air B200, Gulfstream-III are all staples of a NASA's well-stocked, versatile hangar.

A key component in many field campaigns is coordinating the aircraft with satellite overpasses, other airplanes and the constantly evolving, dynamic weather conditions. Given the variables involved, developing a good flight plan that meets the objectives of the field experiment can be a challenging and time consuming task. Planning a research aircraft mission within the context of meeting the science objectives is complex task because it is much more than flying from point A to B. Flight plans typically consist of flying a series of transects or involve dynamic path changes when "chasing" a hurricane or forest fire. These aircraft flight plans are typically designed by the mission scientists then verified and implemented by the navigator or pilot. Flight planning can be an arduous task requiring frequent sanity checks by the flight crew. This requires real time situational awareness of the weather conditions that affect the aircraft track.

Scientists at the University of Alabama-Huntsville and the NASA Marshall Space Flight Center developed the Waypoint Planning Tool, an interactive software tool, that enables scientists to develop their own flight plans (also known as waypoints) with point-and-click mouse capabilities on a digital map draped with real time satellite imagery. The Waypoint Planning Tool has further advanced to include satellite orbit predictions and seamlessly interfaces with the Real Time Mission Monitor which tracks the aircraft's position when the planes are flying.

This presentation will describe the capabilities and features of the Waypoint Planning Tool highlighting the real time aspect, interactive nature and the resultant benefits to the airborne science community.